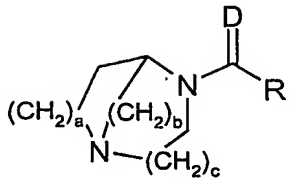
CLAIMS

1. A compound of formula I:



I

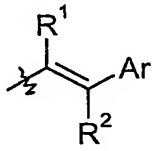
wherein:

a, b and c are each 1 or 2;

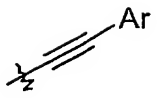
D is oxygen or sulfur, and

R is selected from moieties of formulae II, III or IV:

II



III



IV

wherein

R^1, and R^2 are independently selected from hydrogen, CN, CF_3, halogen, C_{1-4}alkyl, C_{2-4}alkenyl, C_{2-4}alkynyl or CO_2R^3;

Ar is phenyl, or

Ar is a 5- or 6-membered aromatic heterocyclic moiety having 1, 2 or 3 heteroatoms selected from nitrogen, oxygen or sulfur where not more than one of said heteroatoms is oxygen or sulfur, or

Ar is an 8-, 9- or 10-membered fused aromatic heterocyclic moiety having 1, 2 or 3 heteroatoms selected from nitrogen, oxygen or sulfur where not more than one of said heteroatoms is oxygen or sulfur, or

Ar is an 8-, 9- or 10-membered aromatic carbocyclic ring,

wherein said phenyl, heterocyclic rings or carbocyclic rings have 0, 1 or more substituents independently selected from hydrogen, CN, NO_2, CF_3, halogen, C_{1-4}alkyl, C_{2-4}alkenyl, C_{2-4}alkynyl, aryl, heteroaryl, OR^3, CO_2R^3 or NR^3R^4; where

R^3 and R^4 are independently at each occurrence selected from hydrogen, C_{1-4}alkyl, aryl, heteroaryl, $C(O)R^5$, $C(O)NHR^5$, CO_2R^5, SO_2R^6, or

R^3, R^4 and N in combination in the substituent $-NR^3R^4$ is $(CH_2)_jQ(CH_2)_k$ where Q is O, S, NR^5, or a bond; j is 2, 3 or 4 and k is 0, 1 or 2;

wherein

R^5 at each occurrence is independently selected from hydrogen, C_{1-4}alkyl, aryl, or heteroaryl, and

R^6 at each occurrence is independently selected from C_{1-4}alkyl, aryl, or heteroaryl;

or an enantiomer or pharmaceutically-acceptable salt thereof.

2. A compound according to Claim 1, wherein D is oxygen.

3. A compound according to Claim 1, wherein a is 1, b is 2 and c is 1,

or an enantiomer or pharmaceutically-acceptable salt thereof.

4. A compound of Claim 1, wherein

Ar is phenyl, or

Ar is a 5- or 6-membered aromatic heterocyclic moiety having 1 or 2 heteroatoms selected from nitrogen, oxygen or sulfur where not more than one of said heteroatoms is oxygen or sulfur;

or an enantiomer or pharmaceutically-acceptable salt thereof.

5. A compound according to Claim 4, wherein Ar is a phenyl, furanyl or thiophenyl; or an enantiomer or pharmaceutically-acceptable salt thereof.

6. A compound according to Claim 1, wherein:

a is 1;

b is 2;

c is 1;

D is oxygen;

R^1 and R^2 are hydrogen;

Ar is phenyl, or

Ar is a 5- or 6-membered aromatic heterocyclic moiety having 1, 2 or 3 heteroatoms selected from nitrogen, oxygen or sulfur where not more than one of said heteroatoms is oxygen or sulfur, or

Ar is an 8-, 9- or 10-membered fused aromatic heterocyclic moiety having 1, 2 or 3 heteroatoms selected from nitrogen, oxygen or sulfur where not more than one of said heteroatoms is oxygen or sulfur, or

Ar is an 8-, 9- or 10-membered aromatic carbocyclic ring;

or an enantiomer or pharmaceutically-acceptable salt thereof.

7. A compound according to Claim 1, wherein:

Ar is selected from phenyl, 2-pyridyl, 3-pyridyl, or 4-pyridyl, 2-furanyl or 3-furanyl, 2-thienyl or 3-thienyl, benzofuran-2-yl; benzofuran-3-yl, benzo[b]thiophen-2-yl or benzo[b]thiophen-3-yl;

or an enantiomer or pharmaceutically-acceptable salt thereof.

8. A compound according to Claim 1, wherein:

Ar is substituted with one or more substituents independently selected from CN, NO_2, CF_3, halogen, C_{1-4}alkyl, C_{2-4}alkenyl, C_{2-4}alkynyl, aryl, heteroaryl, OR^3, CO_2R^3 or NR^3R^4;

or an enantiomer or pharmaceutically-acceptable salt thereof.

9. A compound according to Claim 1 selected from:

(1,4-diazabicyclo[3.2.2]non-4-yl)(phenyl)methanone;

(1,4-diazabicyclo[3.2.2]non-4-yl)(3-fluorophenyl)methanone;

(1,4-diazabicyclo[3.2.2]non-4-yl)(4-fluorophenyl)methanone;

(3-chlorophenyl)(1,4-diazabicyclo[3.2.2]non-4-yl)methanone;

(4-chlorophenyl)(1,4-diazabicyclo[3.2.2]non-4-yl)methanone;

(1,4-diazabicyclo[3.2.2]non-4-yl)(3,4-dichlorophenyl)methanone;

(3-bromophenyl)(1,4-diazabicyclo[3.2.2]non-4-yl)methanone;

(4-bromophenyl)(1,4-diazabicyclo[3.2.2]non-4-yl)methanone;

(1,4-diazabicyclo[3.2.2]non-4-yl)(3-iodophenyl)methanone;

(1,4-diazabicyclo[3.2.2]non-4-yl)(4-iodophenyl)methanone;

(1,4-diazabicyclo[3.2.2]non-4-yl)(4-trifluoromethylphenyl)methanone;

(1,4-diazabicyclo[3.2.2]non-4-yl)(4-methoxyphenyl)methanone;
(1,4-diazabicyclo[3.2.2]non-4-yl)(4-trifluoromethoxyphenyl)methanone;
(5-chlorofuran-2-yl)(1,4-diazabicyclo[3.2.2]non-4-yl)methanone;
(5-bromofuran-2-yl)(1,4-diazabicyclo[3.2.2]non-4-yl)methanone;
(5-iodoofuran-2-yl)(1,4-diazabicyclo[3.2.2]non-4-yl)methanone;
(5-chlorothiophen-2-yl)(1,4-diazabicyclo[3.2.2]non-4-yl)methanone;
(5-bromothiophen-2-yl)(1,4-diazabicyclo[3.2.2]non-4-yl)methanone;
(5-iodoothiophen-2-yl)(1,4-diazabicyclo[3.2.2]non-4-yl)methanone;
(1,4-diazabicyclo[3.2.2]non-4-yl)(naphthalen-2-yl)methanone;
(1,4-diazabicyclo[3.2.2]non-4-yl)(benzofuran-2-yl)methanone;
(1,4-diazabicyclo[3.2.2]non-4-yl)(benzo[b]thiophen-2-yl)methanone;
1-(1,4-diazabicyclo[3.2.2]non-4-yl)-3-phenylpropenone;
1-(1,4-diazabicyclo[3.2.2]non-4-yl)-3-phenylpropynone;
1-(1,4-diazabicyclo[3.2.2]non-4-yl)-3-(furan-2-yl)propenone;
1-(1,4-diazabicyclo[3.2.2]non-4-yl)-3-(furan-3-yl)propenone;
1-(1,4-diazabicyclo[3.2.2]non-4-yl)-3-(thiophen-2-yl)propenone;
1-(1,4-diazabicyclo[3.2.2]non-4-yl)-3-(thiophen-3-yl)propenone;
(1,4-diazabicyclo[3.2.2]non-4-yl)(furan-2-yl)methanone;
(E)-1-(1,4-diazabicyclo[3.2.2]non-4-yl)-3-(furan-2-yl)propenone;
(E)-1-(1,4-diazabicyclo[3.2.2]non-4-yl)-3-(thiophen-2-yl)propenone;
(E)-1-(1,4-diazabicyclo[3.2.2]non-4-yl)-3-(2-methoxyphenyl)-propenone;
(E)-1-(1,4-diazabicyclo[3.2.2]non-4-yl)-3-(2-methylphenyl)propenone;
(1,4-diaza-bicyclo[3.2.2]non-4-yl)-(1H-indol-5-yl)-methanone;
(1,4-diaza-bicyclo[3.2.2]non-4-yl)-(methyl-1H-indol-2-yl)-methanone, and
(Z)-1-(1,4-diaza-bicyclo[3.2.2]non-4-yl)-2-fluoro-3-phenyl-propenone,

or an enantiomer or pharmaceutically-acceptable salt thereof.

10. A compound according to any one of Claims 1 to 10, for use in therapy.

11. A compound according to any one of Claims 1 to 10, for use as a medicament.

12. Use of a compound as defined in any one of claims 1 to 10, in the manufacture of a medicament for the treatment or prophylaxis of psychotic disorders, intellectual impairment disorders, human diseases or conditions in which activation of the α7 nicotinic receptor is beneficial, Alzheimer's disease, learning deficit, cognition deficit, attention deficit, memory loss, Lewy Body Dementia, Attention Deficit Hyperactivity Disorder, anxiety, schizophrenia, mania or manic depression, Parkinson's disease, Huntington's disease, Tourette's syndrome, neurodegenerative disorders in which there is loss of cholinergic synapse, jetlag, cessation of smoking, nicotine addiction including that resulting from exposure to products containing nicotine, pain, ulcerative colitis or irritable bowel syndrome.

13. A method of treatment or prophylaxis of psychotic disorders, intellectual impairment disorders, human diseases or conditions in which activation of the α7 nicotinic receptor is beneficial, Alzheimer's disease, learning deficit, cognition deficit, attention deficit, memory loss, Lewy Body Dementia, Attention Deficit Hyperactivity Disorder, anxiety, schizophrenia, mania or manic depression, Parkinson's disease, Huntington's disease, Tourette's syndrome, neurodegenerative disorders in which there is loss of cholinergic synapse, jetlag, cessation of smoking, nicotine addiction including that resulting from exposure to products containing nicotine, pain, or ulcerative colitis which method comprises administering a therapeutically effective amount of a compound as defined in any one of Claims 1 to 10.

14. A pharmaceutical composition comprising a compound of formula I, as defined in any one of claims 1 to 10, together with at least one pharmaceutically-acceptable excipient or diluent.